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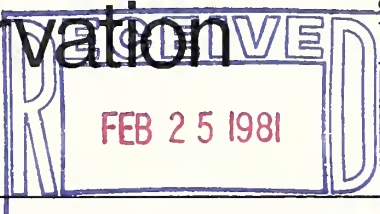


United States  
Department of  
Agriculture

Soil  
Conservation  
Service



# Soil & Water Conservation News



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## SCS Releases the Latest and Best in Conservation Plants

by Donald L. Comis

Each year the Soil Conservation Service and cooperating agencies—after years of testing and selection—name and release superior varieties of plants to be used in programs to conserve soil, water, and related resources. SCS released 5 plants in 1980 and 14 in 1979, bringing the total number of conservation plants released to date to over 200. These plants include grasses, forbs, shrubs, and trees. SCS selects grasses primarily to protect soil on range and disturbed areas from wind and water erosion, while providing forage for cattle, and food and cover for wildlife. SCS selects most shrubs

and trees for planting as windbreaks, for wildlife food and cover, and for stabilizing critical areas. Many tree and shrub varieties may also be used for landscaping.

The plants released in 1980 include three native grasses, one native forb, and one native shrub. The grasses are: 'Shoshone' beardless wildrye, 'Secar' bluebunch wheatgrass, and 'Hachita' blue grama. The forb is 'Appar' lewis flax and the shrub is 'Konza' aromatic sumac.

Shoshone is a cool-season rhizomatous grass suited for wet or wet-saline-alkaline soils in Montana and Wyoming. Secar is a perennial cool-season bunchgrass adapted to dry rangelands at low elevations in the Pacific Northwest. Hachita is a warm-season grass that thrives in arid conditions in a wide range of soils in the Southwest.

Appar is a perennial, attractive forb that provides additional soil protection and wildlife food and cover in the Intermountain Region of the West.

Konza is a deciduous, perennial, tall shrub that is drought tolerant and adapted to a wide variety of soils in parts of the Midwest.

The 1979 plants include six perennial grasses, six shrubs, and two deciduous trees. The grasses are: 'Cimarron' little bluestem, 'Ganada' yellow bluestem, 'Viva' galleta, 'Cochise' Atherstone lovegrass, 'Magnar' basin wildrye, and 'Canbar' canby bluegrass. All except Viva are bunchgrasses.

Cimarron is a tall, warm-season grass recommended for dry lands in western and central Kansas, the Oklahoma and Texas Panhandles, eastern Colorado, and southwest Nebraska. Ganada is an introduced, warm-season grass recommended for New Mexico and Colorado. Viva is a warm-season rhizomatous grass recommended for southwestern rangelands. Cochise is an introduced, tall, warm-season grass that is recommended for Arizona and from

*Continued on next page.*

## 4-H Youths Win Awards for Natural Resource Conservation

Six teenagers who entered projects in the conservation of natural resources program were among those who won awards at the 59th National 4-H Congress last December.

Michael Glover from Elizabethton, Tenn., won an award for conducting a survey on water quality among residents of his community. He made a telephone survey of 50 local residents to get their views on water quality. He also made a door-to-door survey on energy conservation of 100 homes and discussed the results with various groups.

Other activities undertaken by the

Carter County youth include restocking streams with brown trout, placing wood duck nesting boxes, and, as a member of his county's Soil Conservation Youth Board, he led other young people in clearing debris from roadsides and yards and seeding areas.

He also helped organize outdoor classrooms at several elementary schools to give students a detailed look at conservation in action, and he taught two wildlife conservation classes at the District 4-H Camp.

Another national winner, Mark Henderson of Wingate, N.C., gave a demonstration on how watersheds could cut down on flood threats. He teamed up with another 4-H'er in the demonstration and visited the Cane Creek Project in his county, confer-

ring with officials about the dam there as they walked about the area. He and his partner set up a mock dam to better share their findings with others.

"After we learned so much about watersheds, my friend and I organized several tours for clubs to visit Cane Creek Park. Those who participated learned that a watershed project can provide many facilities for community use," Henderson said.

James McAleese of Wellington, Ohio, compiled a 12-volume educational instructional series on wildlife by taking photos and doing his own research. In addition, he planted 1,000 shrub seedlings for wildlife food and cover and for erosion protection. He also planted about 1,000 tree seedlings and upgraded 5 acres

*Continued on next page.*

*Soil and Water Conservation News* is the official magazine of the Soil Conservation Service. The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of public business required by law of this Department. Use of funds for printing *Soil and Water Conservation News* has been approved by the Director of the Office of Management and Budget through January 31, 1985. *Soil and Water Conservation News* (ISSN-0199-9060) is published 12 times a year. Controlled circulation postage paid at Washington, D.C.

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Superintendent of Documents  
U.S. Government Printing Office  
Washington, D.C. 20402

#### SCS Releases Conservation Plants, cont.

Texas west to California, at elevations from 1,500 to 6,000 feet.

Magnar is a tall, cool-season grass that can serve as a grass windbreak and provide improved soil protection, grazing, and cover for wildlife, especially pheasants, in much of the Western United States. Canbar is a cool-season grass that helps control weeds, like cheatgrass, in shallow sites on rangelands in the Pacific Northwest and the northern mountain States.

The shrubs released in 1979 are: 'Elsberry' autumn-olive, 'Cling-Red' Amur honeysuckle, 'Bighorn' skunkbush sumac, 'Dorado' bladderpod, 'Marana' fourwing saltbush, and 'Casa' quailbush. The first three are tall, deciduous shrubs; the last three are shorter, evergreen to semi-evergreen shrubs.

Elsberry and Cling-Red are two introduced shrubs useful in windbreaks, screens, and barriers. They also provide fruit for wildlife in the

winter. Elsberry grows best in parts of the Midwest. Cling-Red grows in most of the Midwest, parts of the Southwest, and Northeast.

Bighorn, Dorado, and Marana are superior selections of native species. Bighorn grows from central New Mexico north to Colorado and Wyoming and east to Minnesota. Dorado and Marana grow best in the southern part of California at elevations up to 4,000 feet. Casa grows from the upper San Joaquin and Salinas Valleys south to lower California. It extends eastward into Nevada, Utah, and New Mexico.

The two trees released as conservation plants are 'Cardan' green ash and 'Imperial' Carolina poplar. SCS selected these trees for windbreaks because they are less susceptible to pest damage than other varieties used in windbreaks. Cardan grows in the northern Great Plains States. Imperial grows in the Great Lakes States, North Dakota, and New Jersey.

Each of these conservation plants was released for commercial production by 1 or more of 22 plant materials centers, in cooperation with State and Federal agencies. SCS operates 18 of these centers and funds or provides technical assistance to the other 4. These centers provide plants or seeds to seed producers and nurseries to begin commercial production of these plants. After releasing a conservation plant, the plant materials centers provide information to help commercial producers, farmers, ranchers, and others grow these plants. SCS encourages commercial production of the plants or seeds but does not sell plant materials to the public. Seed producers and nurseries usually have the plants or seeds ready for sale in quantity 2 years after the plants are released.

**Donald L. Comis,**  
assistant editor, *Soil and Water Conservation News*, SCS, Washington, D.C.

#### 4-H Youths Win Awards, cont.

of neglected wooded area for his woodland multi-use reclamation project.

Another of the award winners, Andrea Snell, from Petersburg, W. Va., saved 40 wildflowers from road construction and worked to promote conservation in her area. Using knowledge about plant habitat, she transplanted each plant into an appropriate habitat.

"It was a lot of hard work, but rewarding because everything except the trailing-arbutus lived and returned the next season," she said.

Snell was asked by her science teacher to talk to each of his classes on rare flowers. She followed this up with her own public education program among students to interest

them in other areas of conservation.

Marie Heitz of Aurora, Iowa, presented skits to make the public more aware of the need for conservation. "My favorite skit was on energy alternatives, presenting the use of the sun and geothermal energy, instead of carbon products," she said.

Heitz also worked with school children to interest them in wildlife and energy conservation. She led her club in trimming weeds around trees at a county park and in making 20 bluebird houses.

Karen Ohland from Bellmore, N.Y., won an award for putting together extensive collections in marine biology and fossils and preparing a fossil map. She started her collections while on family camping trips throughout the United States.

She arranged her fossil map according to the age of each specimen with keyed labels corresponding to a U.S. map and indicating the spot she had found each. She also prepared an exhibit on shells and other marine life.

Each of the winners was awarded a \$1,000 educational scholarship donated by John Deere, sponsor of the 4-H conservation program. More than 490,000 4-H members participate in the conservation program.



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Secretary of Agriculture

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Prepared by Information and Public Affairs  
Soil Conservation Service  
U.S. Department of Agriculture  
Washington, D.C. 20013

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All programs of the U.S. Department  
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## Comments:

### *from the SCS Chief*

To date, plant materials centers (PMC's) operated by the Soil Conservation Service with cooperating agencies have tested and released more than 200 different varieties of conservation plants for commercial production and use in conservation programs. Over the years, some of those varieties have been replaced with superior plants. Currently, seed growers and nurseryowners are commercially producing more than 140 SCS-released varieties. The PMC's have released most of these plants for solving soil and water conservation problems within the last 10 years. In 1979, the commercial value to the seed and plant industry from the commercial production of SCS-released plant varieties was approximately \$26 million. Provided the plants were used at the SCS recommended seeding or planting rate, they would have treated 1.3 million acres.

All over this country, plant cover provided through SCS-released plant materials is helping control erosion and sedimentation by stabilizing the soil, filtering runoff, and serving as windbreaks. This plant cover also provides many side benefits. Conservation plant materials provide food and cover for wildlife, provide forage for livestock, beautify the landscape, and, if properly selected and positioned, can cut energy costs for heating and cooling houses and commercial buildings.

Last year, the State Conservationist's Committees for PMC's assisted with a national study to determine if there were practicable alternatives for the staffing, financing, and/or managing of PMC's. Through a public participation campaign conducted by SCS, citizens considered alternatives to Federal management and support of the centers. Of the responses received, 85 percent recommended that SCS continue operating the PMC's with adequate SCS funding. In addition another 7 percent of the responses favored continued operation of PMC's by SCS, but encouraged additional non-USDA participation in this program.

The U.S. Department of Agriculture approved the recommendation that SCS continue operating the PMC's, and the recommendation was validated by the President's budget for fiscal year 1982.

We can be proud of the public's confidence that SCS is the best agency to operate the PMC program. We plan to continue the search for conservation plants to meet the needs of all SCS soil and water conservation programs including plants with potential energy conservation characteristics.



# News Briefs

## Caucasian Bluestem Aids in the Search for a Balanced Forage Program

The Howell County, Mo., Soil and Water Conservation District (SWCD) supervisors initiated a program in the early 1970's to introduce an adapted grass to fill the grazing gap when tall fescue was dormant during the summer months.

Working closely with the Soil Conservation Service, the SWCD decided to try a relatively new grass, caucasian bluestem, in an experimental plot. Seed for a 6-acre plot was obtained from the SCS plant materials center at Elsberry, Mo.

In May 1974, Howell County SWCD Cooperator Tom Norton planted 6 acres of caucasian bluestem, the first in Howell County. The seed was mixed with 10-20-10 fertilizer and planted with a grain drill on a well-prepared seedbed. Seeding rate was 3.5 pounds per acre. The area was isolated by electric fencing to restrict grazing. After substantial germination, the grass was sprayed to control broadleaf weed growth. The grass grew rapidly in spite of a dry summer and in late October, 417 pounds of bulk seed was combined. After harvesting, the cattle consumed all the straw and stubble.

Further study and research suggested that caucasian bluestem could balance out the pasture program in the Ozarks. Enthusiastically, the SWCD set up a program to inform the public of the advantages of caucasian bluestem for summer pasture.

The campaign for a balanced forage program led to contact with surrounding counties including some counties in the neighboring State of Arkansas. It was learned through SCS District Conservationist Alan

Heirman that the Boone County, Ark., SWCD was testing caucasian bluestem along with other warm-season grasses in their experimental plot. Sharing a problem and seeking the same goal, the two SWCD's and other interested nearby districts began an exchange of technical information, tours, news releases, and program presentations. Working together, the SWCD's were better able to inform the public of evaluations and study results.

The experimental grass has been well accepted in the Ozarks over the last few years. According to test results, caucasian bluestem is a high forage producer, winter hardy, and able to withstand normal drought conditions. A good stand can be obtained by seeding 1 to 2 pounds pure live seed per acre. Cattle on caucasian bluestem will make excellent gain during the hot summer months. In food value the grass is lower than fescue during the optimum growth period for each, but caucasian bluestem will outproduce fescue in total pounds of forage. Two seed harvests are possible each year, depending on management and location. The grass reseeds itself in addition to producing a good seed crop. By maintaining a fertility program hay production can also be a big part of the caucasian bluestem summer forage program. Another point in favor of the grass is that it withstands more abuse and close grazing than some of the other warm-season grasses.

Although seed availability has been a problem, several hundred acres of caucasian bluestem can now be found in southern Missouri and northern Arkansas. Most of these established stands have been seeded from local seed crops. Production and use of seed locally have been a major factor in the program's success.

Producers who have been introduced to caucasian bluestem see the plant as an ideal grass to fill the summer forage gap from May to October when the fescue is dormant.

The Howell County SWCD, working closely with SCS and other area SWCD's, is continuing study and research on warm-season grasses. Other grasses which have been brought into the area for evaluation are plains bluestem, indiagrass, big bluestem, bermudagrass, 'Morpa' weeping lovegrass, and eastern gamagrass. These grasses are proving to be very successful also.

As much as one-third more production can be realized through a balanced pasture program. At the current rate of acceptance for summer grasses, it is felt that within 5 to 10 years they will have a tremendous impact on this area's economy, and on controlling soil erosion.

Howard Coambes,  
district conservationist,  
SCS, West Plains, Mo.

## Native Grasses Fill Summer Grazing Gaps

Dick Walker restored Missouri's native grasses, legumes, and forbs, without reseeding, on his ranch in the Ozarks.

The Walker Ranch is an 880-acre, cow-calf and steer operation in Douglas and Webster Counties, about 40 miles east of Springfield, Mo.

Walker restored the native plants by burning and spraying areas of low-quality timber. He planted cool-season grasses like tall fescue and orchardgrass in some areas and allowed warm-season, native grasses to reestablish naturally in other areas.

The Walker Ranch is in a transitional area between prairie and woodland, so when conditions allow, the prairie grows back when trees are removed. Douglas Switzner, Soil Conservation Service resource conservation and development coordinator, helped Walker develop the native grass pastures.

Walker now has a year-round grazing system. In spring and early summer, the cattle graze on cool-season grasses. By late summer, Walker opens the gates to the native grasses, legumes, and forbs. The native grasses have to be fenced and managed because the cattle prefer them to the cool-season grasses much of the year. The native grasses fill the grazing gap that occurs from June to September when the cool-season grasses are dormant.

The predominant native grasses on the Walker Ranch are big bluestem, little bluestem, indiangrass, switchgrass, and sideoats grama. Some legumes are purple and white prairieclovers, leadplant, Illinois bundleflower, roundhead lespedeza, and prairie acacia. The forbs include compassplant, rattlesnake master, and gayfeather.

John Lumb, SCS district conservationist for Douglas County, has talked to elderly people who remember when the hillsides were covered with indiangrass and big bluestem "so tall that a man on horseback couldn't see over the top of the grasses." Dick Walker is trying to bring back those days.

The Southern Section of the Society for Range Management, which includes 10 States, named Dick Walker the outstanding rangeman for 1980.

**Donald L. Comis,**  
assistant editor, *Soil and Water Conservation News*, SCS, Washington, D.C.

## Global 2000 Report Called a "Timely Warning"

The Council on Environmental Quality and the U.S. Department of State have released *The Global 2000 Report to the President*, a report that projects probable changes in the world's population, natural resources, and environment during the next two decades if current policies continue.

A team of 14 leading government experts, led by Dr. Gerald O. Barney, prepared the report. Dr. Barney hopes the team can serve as a foundation for future inter-agency planning by the Federal Government.

According to the report, for every two persons on the Earth in 1975, there will be three in 2000, with most of the increase in less developed countries that already have too little wealth to divide. The economic gap between the richest and poorest nations will widen. The population increase will mean a steady increase in use of natural resources. The supplies of agricultural land, food, water, fish, minerals, energy, and firewood and other forest products will decline relative to demand. The population pressures will increase abuse of the environment and competition for natural resources among nations.

The report said that there will be strong pressure to increase crop yields through genetic methods and the application of pesticides and fertilizers. The possibility of a massive crop failure increases as the world's major food crops become more genetically uniform. Pesticides and fertilizers may damage the environment and are dependent on the availability of oil. Food production will be more vulnerable to disruptions of energy supplies and to weather fluc-

tuations as farming expands to less productive lands.

The report also said that pressures to continue increasing yields will add further to a serious soil deterioration problem. "Soil deterioration is the number one problem all over the world," in the opinion of Dr. Barney. Soil erosion will remove, on the average, several inches of soil from croplands all over the world by 2000. Desertification (including salinization in irrigated lands) may claim a significant part of the world's rangeland and cropland.

"This report is not a doomsday report but a timely warning," Dr. Barney said. He stressed that the report is a projection, not a prediction. It assumes that public policies throughout the world will not change. Dr. Barney and his staff hope the report will stimulate changes, and he sees encouraging signs of change around the world. He agrees with Edmund S. Muskie, former Secretary of State, who said: "If we begin our work now, we will say in 20 years that the *Global 2000* was. . . wrong. And we will congratulate ourselves for having the foresight to build a better future."

The report is available in three volumes from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. (Volume 1, The Summary Report, \$3.50, Stock No. 041-011-00037-8; Volume 2, The Technical Report, \$13, Stock No. 041-011-00038-6; Volume 3, The Government's Global Model, \$8, Stock No. 041-011-00051-3.)



# This Manure System Uses Gravity Power

by Greg Mund

**W**ith the help of gravity and a smooth steel pipe, Eilert Barnes moves manure from his freestall dairy barn to an outside storage pit. It's cheaper than investing in a manure pump or a reinforced concrete "push-off" wall, Barnes says, and with today's high interest rates, cheaper can be better. He says he's using less labor than he was using with his former system. And perhaps most important, Barnes says his gravity-flow manure system seems to work.

Barnes and his wife Sandy own a 70-cow dairy in the rolling hills of western Iosco County, Mich. The Barnes' dairy barn is planted at the top of one of those Iosco County hills, on a slope that gives Barnes a natural setting for a gravity-flow set up.

Building a gravity-flow system in Michigan is still, in many respects, an experiment. New York and Pennsylvania are the hubs of gravity-flow information, and only a sparse handful of Michigan farmers have given the concept a try.

The system has restrictions. A gravity-flow pipe system needs enough of a drop between the barn floor and the top of the storage pit to assure free manure flow. The amount of drop needed depends on the kind of bedding, the amount of bedding that will be mixed with the manure, and the amount of waste water. The system seems to work best in confinement barns where there is some tempering of manure consistency—less drying in summer; little freezing in winter. Free-flowing manure is vital to a gravity-flow system.

Barnes' operation meets the standards. He has a drop of more than 7 feet from his confinement barn floor to the top of his storage pit. It's 9½ feet from the bottom of the "manure catcher" or hopper to the bottom of

the storage pit. The pit is close to the barn so Barnes only has 31 feet of 30-inch diameter pipe that funnels manure into the pit.

In the Barnes' operation, manure is scraped into a 3- by 4-foot hopper, 3-feet deep, that is buried under the barn floor. The hopper funnels the manure into an underground pipe. The pipe empties into the bottom of a solid storage pit. By the time cold weather sets in, Barnes explains, the manure has covered the pipe outlet, and frozen manure can't block the flow of the system.

Polluted rainwater, from an outside exercise lot, is channeled around the solid storage pit through an earthen canal to a liquid holding pond. That same holding pond, downhill from the solid storage pit, collects the runoff from the manure, too. The solid manure is kept in the solid storage pit by a wooden picket fence, designed with vertical planks and three-quarter-inch cracks that let only rainwater and seepage into the holding pond.

To save labor and money, Barnes decided to use his existing disposal equipment with a solid storage pit and a liquid holding pond. It would cost less, he reasoned, than installing a single semi-liquid storage pit, which would require agitation, loading pumps, and a tank wagon for field disposal. And he could still squeeze some fertilizer value from that manure. Before, Barnes had a manure pile; not a complicated elimination system, but a fairly common one—the kind that sits there until it can be hauled out and spread on the field.

But like a growing number of farmers who want to use manure for more than barnyard clutter, Barnes was concerned about nutrient loss from that manure pile. He got disgusted with seepage, and he got disgusted with the runoff water that inched its

way across his barnyard.

Now Barnes saves fuel and equipment wear. In addition, he can plow the manure right into the soil after he's finished spreading it in spring. And with the new system, Barnes expects a fertilizer ratio of 5-2-6 (pounds of nitrogen, phosphorus, and potassium available per ton of manure).

When he compares the cost of his gravity-flow system to a pump, Barnes explains the real reason the system looked so attractive.

"I have about \$1,130 in the pipe and hopper, and it would have cost me between \$5,000 and \$7,000 for a manure pump—that's a big difference. The total cost for the completed system ran about \$10,000. That includes the pipe and all the earth work, concrete, treated wood for the picket fence, my labor, and materials from the farm.

"I shouldn't run into the usual problems when clean-out starts," Barnes continues. "Instead of being on mud, I have a concrete floor and ramp to load from. There won't be any problems with the manure pack staying frozen until June or July.

"It used to be, when I'd scrape out the doors to pile the manure, I'd drive over it when it got solid enough, and I'd push the frost deeper into the pack. With 6 months' storage, I can time my manure disposal when soil conditions are right and reduce soil compaction."

Barnes likes his barnyard better, too. It's neat, and the storage area "can be mowed to control weeds and brush."

Barnes admits he's a little concerned about winter freezing. Manure can freeze on the barn floor in the middle of a northern lower-Michigan winter. But Barnes doesn't believe it will be severe enough to cause many



headaches. He can push frozen manure out the door to the nearby pit, or he can direct warm milkhouse water through pipe to prevent freezing.

And there are other concerns, too, he says. Even though manure from a freestall confinement barn is quite liquid, too much bedding can be bad news.

"Straw or sawdust can make the manure too thick, and it won't flow. With a little care, I don't expect to have any problems. If I have to, I can add water from the milking parlor and it'll flow even with the extra bedding."

If money hadn't been a limiting factor, Barnes says, he would have installed a combined solid-liquid system.

"I still have that option with a little earth work and by hooking my milkhouse drain into the gravity-flow pipe."

Gravity flow has made Eilert Barnes' system less expensive to install and easier to operate. And while it may not work on many sites, it is working for Barnes. Perhaps even Isaac Newton would be impressed.

**Greg Mund,**  
was SCS district conservationist in  
East Tawas, Mich., and is now district  
conservationist in Gladwin.

Reprinted from the May 17, 1980,  
issue of *Michigan Farmer*.



Before dairy farmer Eilert Barnes built his gravity-flow manure system, he was concerned about nutrient loss and seepage from his old manure pile, he disliked the unsightly barnyard, and he had problems with frozen manure he couldn't spread even into June or July.



Today, Barnes' gravity-flow system allows him to store manure for 6 months so he can spread it onto his fields when soil conditions are right, and reduce soil compaction.



## Tennessee County Gets Clean Streams and Keeps Mash Feeding Program

by Nancy M. Garlitz

**B**ased on some of its vital statistics, you wouldn't expect much out of the ordinary to be going on in Moore County, Tenn.: It has one town, Lynchburg (population about 400); it's the smallest of the State's 95 counties with about 70,000 acres; and the major industry is feeding cattle for resale.

But, on the contrary, there are lots of extraordinary things going on in Moore County. Lynchburg is the home of the Nation's oldest registered whiskey distillery and the scene of some remarkable soil and water conservation work. It may sound like a strange combination—a whiskey distillery and conservation—but in Moore County they mix very well.

The conservation work involves cleaning up the county's only major watershed, East Mulberry Creek. Livestock waste carried by runoff from the county's steep, hilly land, which supports about 20,000 head of cattle and hundreds of goats, hogs, and horses, had polluted area streams. In the early 1970's, the amount of coliform bacteria in the creek ran so high during periods of heavy rainfall that public health water quality experts were unable to count it using conventional methods.

The situation alarmed the Department of Public Health and area residents because the intake for Lynchburg's city water treatment plant was located downstream from many of the county's feedlot operations. To insure the safety of Lynchburg's residents, the Jack Daniel distillery financed converting the public water supply source from Mulberry Creek to Tims Ford Reservoir. The conversion ended the immediate health threat to local residents, but the stream remained polluted and retained the potential for transmitting water-borne disease.

Before agencies or individuals could act to clean up the streams, they had to look at what had led to the pollution problem. Although the steep topography was a major factor, the problem could also be traced to the Jack Daniel distillery's mash feeding program.

Most Moore County cattle don't just eat hay—they also eat spent stillage, or liquid mash, a byproduct of Jack Daniel's whiskey making operation. The mash is basically grain—corn, rye, and barley malt. The distillery sells the mash to farmers at \$4 per 1,000 gallons which provides a complete, high-protein ration for about 40 head of cattle a day.

For the distillery the mash feeding program is a safe, beneficial way to dispose of the more than 360,000 gallons of stillage it produces daily, and for farmers it is a convenient, low-cost way to feed their cattle. One farmer, Sutton Woodard, hauls

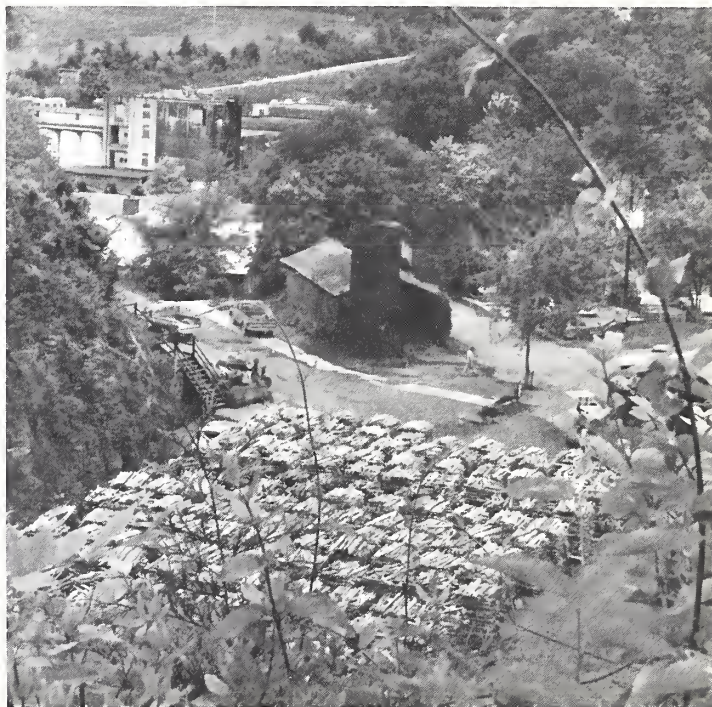
17,000 gallons of mash a day. The temperature of the mash is about 200 degrees F when it is put into the troughs, and Woodard says the cows sip it like people sip hot coffee.

Farmers haul the liquid mash in big tank trucks from the distillery's holding vats. Because of a lack of adequate access roads for the big trucks into their farm operations, farmers had set up their feedlots beside the main roads. Since roads and streams follow the path of least resistance, most of the feedlots were located beside and sometimes even in streams. Every heavy rainfall flushed the livestock waste from the feedlots into nearby streams.

When the Department of Public Health proposed that the mash feeding program be terminated in an effort to improve water quality in the Mulberry Creek watershed, lots of people began taking notice. "Stopping the mash feeding program would've been

Nestled in the hills of south-central Tennessee lies the Jack Daniel whiskey distillery, the Nation's oldest registered whiskey distillery. In the distillery's rickyard (foreground) the hard sugar maple wood used in making charcoal for the charcoal mellowing process that all Jack Daniel's whiskey goes through is split, stacked, and burned. The whiskey is distilled and charcoal mellowed in the buildings in the background.

Photo by Joe Clark, Farmington Hills, Mich.





bad for us and bad for the farmers who depend on the distillery for some, or all, of their cattle feed," says Jack Daniel's plant manager. "We recognized that the farmers had a responsibility to keep livestock waste out of the water; but we also recognized that as the supplier of the mash, the distillery had a responsibility to the community."

Soil Conservation Service soil conservation technician in Lynchburg, John Williamson, says he realized that the solution to the problem was not to choose between keeping the mash feeding program or cleaning up the watershed, but to do both.

"I was with the Department of Public Health's Division of Water Quality Control when this was all coming to a head," says Doug Clark, currently environmental coordinator for the Jack Daniel distillery, "and Williamson's determination and spirit won me over. John and I then convinced

health department administrators that we had to make this thing work like a service to the community, and we did. It could never have worked simply through regulations."

In August 1978, individuals from the Department of Public Health's Division of Water Quality Control, Jack Daniel Distillery, Moore County Soil Conservation District (SCD), SCS, the Extension Service of the Science and Education Administration, the Agricultural Stabilization and Conservation Service (ASCS), the Tennessee Department of Agriculture, and other Federal, State, and local agencies and county farmers and residents held a meeting in Lynchburg to plan their strategy.

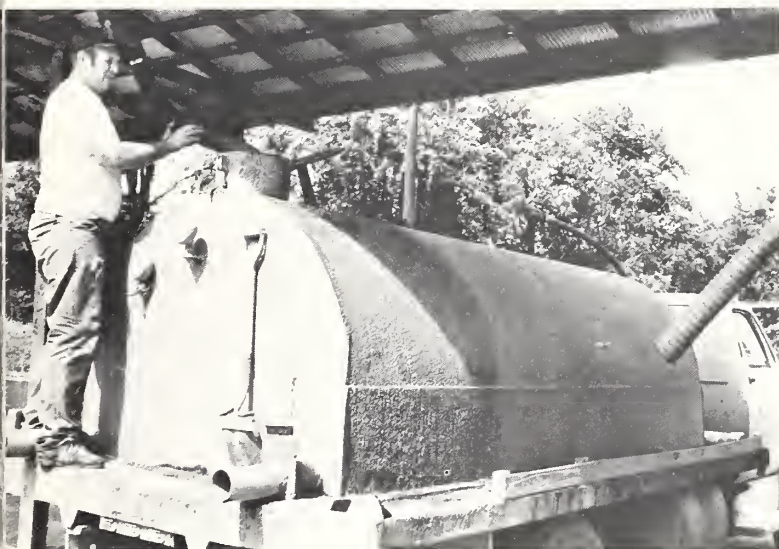
The participants agreed that SCS and the Division of Water Quality Control should provide technical assistance to farmers in developing feeding site plans. The Jack Daniel distillery provided the crucial incen-

tive for mash feeders to join in the cleanup program by agreeing to stop supplying mash to any feedlot operator refusing to cooperate.

Williamson and Clark then contacted every mash feeder in the watershed. "We stayed on a rigid schedule, working through the winter and all kinds of weather to get the conservation planning done," says Williamson.

"Most of the farmers had already decided how to clean up their feedlot operations when we got to them," says Clark. "The distillery had to cut off the mash supply to only one farmer."

Provided their cleanup work follows SCS guidelines, farmers are receiving cost sharing from ASCS through the Agricultural Conservation Program. Farmers can receive 75 percent cost sharing for critical area treatment and 50 percent cost sharing for seeding permanent vegetative



Photos on this page by Jim Bilyeu, public information officer, SCS, Nashville, Tenn.

At left, Sutton Woodard, a Moore County farmer who hauls 17,000 gallons of spent stillage a day to feed his beef cattle for resale, fills his tank truck with mash from the Jack Daniel distillery's waste holding tanks. At right, John Williamson, SCS soil conservation technician (left), and Doug Clark, environmental coordinator for Jack Daniel's, overlook one of the distillery's mash holding tanks. About 12,000 gallons of mash per hour empty into the holding tanks during whiskey making.





cover, improving permanent vegetative cover, installing water impoundment reservoirs, and installing animal waste control facilities.

One year after the cleanup effort was organized, 160 waste management plans had been written and 120 of them had been installed and completed. In addition to waste handling facilities, conservation planning included runoff diversions, filter areas below feeding sites, access roads to feeding sites, livestock watering ponds, revegetation of pastures, and critical area treatment. By July 1980, Mulberry Creek was approved by the health department as a raw water source for the Lynchburg water system.

## Distillery's Role in Conservation Grows

The Jack Daniel whiskey distillery in Lynchburg, Tenn., is one of the Nation's few distilleries selling wet stillage for cattle feed. Because ethanol production also yields wet stillage, ethanol producers are becoming increasingly interested in Jack Daniel's wet stillage feeding program.

"We've had requests from ethanol producers from all over the country on how to manage wet stillage," says Doug Clark, environmental coordinator for the Jack Daniel whiskey distillery. "We plan to work closely with ethanol producers who will have the same kind of waste disposal problem with wet stillage as Jack Daniel's has."

Currently, the distillery is working with the University of Tennessee on a three-phase program to determine the best ways to feed wet stillage to gain the most efficiency from it. As part of the program, the university is

"The most widely applied conservation practice in the watershed is grassed strips which serve as buffer zones to filter waste from runoff," says Clark. "The grassed strips play an important part in overland waste management here."

The distillery inspects feedlots about twice a year for compliance with water quality protection standards. Jack Daniel's expects the number of mash feeders to increase as the amount of available stillage increases, and the distillery makes sure that potential feeders meet environmental standards so there is no delay when the mash becomes available.

"These conservation plans are more than just a benefit to water

quality; they are also consistent with soil conservation and the farmers' goals," says Clark. "Farmers were farsighted enough to realize that if conditions continued to deteriorate, it would only jeopardize their own business and that of future generations."

"We're all in better shape now," says Moore County SCD Supervisor Henshaw. "And we can keep our farms in better shape with the new conservation planning."

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Nancy M. Garlitz,  
associate editor, *Soil and Water  
Conservation News*, SCS, Washington, D.C.

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running digestibility trials in Knoxville and will set up a research center in Lynchburg.

The distillery is also involved in re-planting sugar maple trees within a 50-mile radius to protect soil and water resources. The distillery uses sugar maple trees in making the charcoal it uses in its charcoal mellowing vats. SCS and other agencies are providing technical assistance.

To save energy and make use of a recoverable waste, Jack Daniel's has installed a boiler facility which can be fueled by sawmill waste, natural gas, diesel fuel, or coal. The distillery's goal is to keep the boiler facility, which generates steam for cooking mash and distilling it, running on sawmill waste 100 percent of the time.

The distillery is working with the University of Tennessee on a way to dispose of the resulting ash. The university is proposing that the ash can be added to the spent stillage used for feed to increase calcium

levels, but the proper ratio of ash to feed still needs to be determined. The remaining ash will be land applied following SCS recommendations.

Jack Daniel's environmental concern and work in improving area streams has not gone unnoticed. The distillery was named the Industrial Conservationist of the Year in 1980 by the Tennessee Conservation League.

Also recognized for its outstanding cooperation and hard work in solving the pollution problem in the Mulberry Creek watershed was the Moore County Soil Conservation District. In January, USDA's Agricultural Stabilization and Conservation Service (ASCS) presented the district with the agency's 1980 Distinguished Group Achievement Award. It is the first time ASCS has given the award to a group outside the agency.

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### Windbreaks

Faster-Growing Windbreaks (Nebr.).  
 John Sautter, Dec., p. 11.  
 Windbreaks Move to Urban America.  
 J. K. Obatala, Dec., p. 8.



# Urban Erosion and Sediment Control Comes to Augusta

by Philip Hadarits

**F**rom its founding until the middle of this century, Augusta, Ga., enjoyed orderly growth and transition from a colonial settlement to an industrial and trade center, then to a southern resort town. The only conservation-related problem was periodic flooding of that portion of the town in the Savannah River flood plain. This flood problem was solved over the years first by a dike system, then by a system of flood control dams built by the U.S. Army Corps of Engineers upstream from Augusta.

The national concern about urban stormwater and erosion control had just begun to gain momentum when Augusta began to experience expensive stormwater and sediment damage. A major creek with its flood plain in the older part of town began to flood with some regularity due to development of the upstream watershed. Ponds and lakes, which had been constructed in the watershed during earlier less dense development, were filled in, thereby removing a good deal of stormwater storage.

During this same period, grading of an 85-acre shopping center site was begun by making a nearly vertical 75-foot cut into a hill on one side of the tract. A major creek was relocated, and the flood plain and old creek bed were filled with material from the cut. When the land disturbance and creek relocation were at their most vulnerable state, the developer went bankrupt. This left the community, for about 5 years, with what looked like an 85-acre borrow pit, in highly erodible marine sediments.

The area, with no cover and a partially relocated creek, was at the main intersection of the major highways serving Augusta. Erosion from this project resulted in the closing of a water-based recreation area in the

heart of the community when a lake one-half mile downstream filled with silt. County taxpayers incurred considerable expense for repairing damage and for settling suits brought against the county government for allowing the damage to occur.

While this community was getting its first taste of stormwater and sediment damage, the Atlanta area was having its own serious problems. In 1976, the Georgia Legislature enacted a statewide sediment-erosion control law. The law allowed counties to enact local ordinances or to come under a statewide umbrella of minimum standards.

The city and county governments of the Augusta area readily adopted similar ordinances which differed only slightly from the pattern suggested by the State Legislature. "One change which was made in the suggested format is worth passing on for consideration," said Irvin N. Reeves, former chairman of the Briar Creek Soil and Water Conservation District. "While the conservation district reviews the plans as in most cases, the local county engineering department also reviews our plans and has the responsibility for enforcement. The review in practice becomes a cooperative effort of county or city government and the conservation district to assure that standards are met and that planned measures can, in fact, be effectively monitored by the county inspector."

The positive approach the local governments have toward developing the sediment and erosion control plans has helped to get the support of the professional people involved. The county inspector actually works with the developer to design a suitable plan with the least cost and the maximum benefit. Thus he has already established an excellent work-

ing relationship with the various contractors and developers, which comes in handy during inspections later.

In reviewing plans, possible problem areas are identified and checked to assure that the person preparing the plan has provided for adequate protection. Either the local government or the conservation district will provide any assistance requested for developing most designs and measures, but the engineer or architect preparing the plan is responsible for any damage or corrective action should the structure fail to provide adequate protection.

In just over 3 years since the ordinance was adopted, about 122 sediment and erosion control plans for new subdivisions and industrial sites have been reviewed by the city, county, and district officials. Of these, nearly 100 are now completed and the county has made the final inspection. For the most part, the program has been accepted by all concerned parties. "Our new growth is now an asset to the community rather than a future liability," said Reeves. "We hope Augusta will continue to be the 'Garden City of the South.'"

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Philip Hadarits,  
district conservationist, SCS, Augusta, Ga.

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# Meetings

## March | April

21-25	North American Wildlife and Natural Resources Conference, Washington, D.C.
27-29	National Wildlife Federation, Norfolk, Va.
29-31	American Pulpwood Association, Atlanta, Ga.

19-22	Association of American Geographers, Los Angeles, Calif.
19-22	National Council of State Garden Clubs, Inc., Atlanta, Ga.
25-30	American Planning Association, Boston, Mass.
29-May 1	Hardwood Plywood Manufacturers Association, Savannah, Ga.

## May

4-7	Garden Club of America, Cincinnati, Ohio
11-14	League of Women Voters of the United States, Washington, D.C.
17-21	American Institute of Architects, Minneapolis, Minn.
25-29	American Geophysical Union, Baltimore, Md.
26-29	Agricultural Management and Water Quality, Ames, Iowa
27-29	Southern Forestry Conference, Williamsburg, Va.

## New Publications

### Stream Renovation: A Necessary Management Practice for "208" Programs

by the Wildlife Management Institute

This color pamphlet presents stream renovation methods that can be used as best management practices to restore and maintain the natural life of streams as required by Section 208 of the Clean Water Act. It is similar to an article that appeared in the *Journal of Soil and Water Conservation*, January-February 1980: "Stream renovation alternatives: the Wolf River story," by Chester A. McConnell and other authors. The major difference in this new article is the emphasis on water quality. The pamphlet contains an insert that lists the guidelines used to renovate the Wolf River.

A limited number of copies is available from the Tennessee Environmental Council, P.O. Box 1422, Nashville, Tenn. 37202.

### Endangered and Threatened Species of New Jersey

by the Soil Conservation Service and the New Jersey Department of Environmental Protection

This 44-page book identifies 52 threatened or endangered species in New Jersey, using color and black and white photographs and drawings. A short narrative for each species includes distinguishing characteristics, distribution and habitat, status management techniques and protective measures, and recommendations.

Copies are available for \$6 from the New Jersey Department of Environmental Protection, Division of Fish, Game, and Wildlife, Endangered and Non-game Species Project, P.O. Box 1809, Trenton, N.J. 08625. Free copies, in limited quantities, are also available to persons working in related fields from the USDA Soil Conservation Service, 1370 Hamilton Street, P.O. Box 219, Somerset, N.J. 08873.

### Western Fertilizer Handbook

by the California Fertilizer Association's Soil Improvement Committee

This sixth edition is a quick-reference handbook with information on soil, water, plant growth, and on fertilizer products, their properties and how best to use them. Although the major emphasis of this book is on usage in Western agriculture, most of the information will be helpful to fertilizer users everywhere. This edition has chapters revised to include new information. A new chapter, Chapter 14, tells horticulturists and home gardeners how to use materials like peat moss to promote plant growth. Farmers, farm advisers, county agents, students, and others interested in soil fertility and in growing plants will find this handbook useful.

The handbook is available for \$5.50 from The Interstate Printers & Publishers, Inc., Danville, Ill. 61832. (Order No. 2122.)

### Trickle Irrigation in the Eastern United States

by the Northeast Regional Agricultural Engineering Service

This manual describes the components of a trickle or drip irrigation system and explains how to plan a specific system. It begins by comparing trickle irrigation systems to sprinkler irrigation systems. Then it discusses evapotranspiration, plant water stress, measurement of soil water losses, and sources of water. Finally, the manual recommends different types of trickle irrigation systems for specific crops like tree fruits, small fruits, and vegetable crops. It explains requirements for greenhouse and nursery irrigation. The appendixes explain how to design the water lines, how to prevent line clogging, and how to calculate daily water application rates. There are diagrams throughout the manual.

Copies are available for \$1.25 from NRAES, Riley Robb-Hall, Cornell University, Ithaca, N.Y. 14853. (Publication No. NRAES-4.)